



Cisco Secure Router 520 Series Hardware Installation Guide

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Preface

This preface describes the objectives, audience, organization, and conventions of this guide, and describes related documents that have additional information. It contains the following sections:

- [Objective, page vii](#)
- [Audience, page vii](#)
- [Organization, page vii](#)
- [Conventions, page viii](#)
- [Related Documentation, page xiii](#)
- [Obtaining Documentation and Submitting a Service Request, page xiv](#)

Objective

This guide provides an overview and explains how to install and connect the wireless and nonwireless Cisco Secure Router 520 Series routers.

For warranty, service, and support information, see the “Cisco One-Year Limited Hardware Warranty Terms” section in the *Readme First for Cisco Secure Router 520 Series* document that was shipped with your router.

Audience

This guide is intended for service technicians who have little or no experience in installing routers and whose goal is to connect the router to the network as quickly as possible.

Organization

This guide is organized into the following chapters and appendix.

Chapter 1, “Product Overview”	Describes the router models and hardware features.
Chapter 2, “Preinstallation Information”	Provides information about safety, unpacking the router, and preparing the router for installation.

Chapter 3, “Router Mounting Procedures”	Provides procedures for mounting the router on a wall, desktop, or rack.
Chapter 4, “Router Installation”	Provides procedures for cabling and installing the router.
Chapter 5, “Troubleshooting”	Describes problems that could occur with the router hardware, possible causes of the problems, and steps for solving the problems.
Appendix A, “Specifications”	Provides router, port, and cabling specifications.

Conventions

This section describes the conventions used in this guide.



Note

Means *reader take note*. Notes contain helpful suggestions or references to additional information and material.



Caution

This symbol means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



Warning

IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Waarschuwing

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

BEWAAR DEZE INSTRUCTIES

Varoitus TÄRKEITÄ TURVALLISUUSOHJEITA

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

SÄILYTÄ NÄMÄ OHJEET**Attention IMPORTANTES INFORMATIONS DE SÉCURITÉ**

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS**Warnung WICHTIGE SICHERHEITSHINWEISE**

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.**Avvertenza IMPORTANTI ISTRUZIONI SULLA SICUREZZA**

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI**Advarsel VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE

Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES**¡Advertencia! INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES**Varning! VIKTIGA SÄKERHETSANVISNINGAR**

Denna varningssignal signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

SPARA DESSA ANVISNINGAR**Figyelem FONTOS BIZTONSÁGI ELOÍRÁSOK**

Ez a figyelmeztető jel veszélyre utal. Sérülésveszélyt rejte helyzetben van. Mielőtt bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplő figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján kereshető meg.

ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!**Предупреждение ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ**

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ

Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA

Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.

GUARDE ESTAS INSTRUÇÕES**Advarsel VIGTIGE SIKKERHEDSANVISNINGER**

Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemeskade. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.

GEM DISSE ANVISNINGER**تحذير****إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في آخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز. قم بحفظ هذه الإرشادات

Related Documentation

The Cisco Secure Router 520 Series product is shipped with a minimal set of printed documentation. Additional product documentation is available on Cisco.com.

In addition to the *Cisco Secure Router 520 Series Hardware Installation Guide* (this document), the Cisco Secure Router 520 Series documentation set includes the following documents.

The following documentation is shipped with the product:

- For warranty, service, and support information, see the *Readme First for Cisco Secure Router 520 Series* document.
- *Cisco Regulatory Compliance and Safety Information Roadmap*

The following Cisco Secure Router 520 Series product documentation is available on Cisco.com:

- *Cisco Secure Router 520 Series Software Configuration Guide*
http://www.cisco.com/en/US/docs/routers/access/500/520/software/configuration/guide/520_SCG_Book.html



Note Use this document to configure the initial router settings by using the command-line interface (CLI).

- *Regulatory Compliance and Safety Information for Cisco Secure Router 500 Series*
http://www.cisco.com/en/US/docs/routers/access/500/520/rcsi/500_rcsi.html

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.



CHAPTER 1

Product Overview

The Cisco Secure Router 520 Series routers are designed for small businesses with up to 50 users and teleworkers who want secure connectivity to corporate LANs and to the Internet. These routers provide advanced security features that include secure Virtual Private Network (VPN) access and comprehensive threat defense with Cisco IOS Firewall, Intrusion Prevention Solution (IPS), and URL filtering. The Cisco Secure Router 520 Series routers also provide dynamic routing and advanced quality of service (QoS) features.

The following sections provide an overview of the Cisco Secure Router 520 Series routers:

- [Router Models, page 1-1](#)
- [Hardware Features, page 1-5](#)
- [Regulatory Compliance, page 1-9](#)

Router Models

The Cisco Secure Router 520 Series routers are available in Ethernet and DSL models. The following sections describe each of the routers:

- [Cisco Secure Router 520 Ethernet-to-Ethernet Routers, page 1-1](#)
- [Cisco Secure Router 520 ADSL-over-POTS Routers, page 1-3](#)
- [Cisco Secure Router 520 ADSL-over-ISDN Routers, page 1-4](#)

Cisco Secure Router 520 Ethernet-to-Ethernet Routers

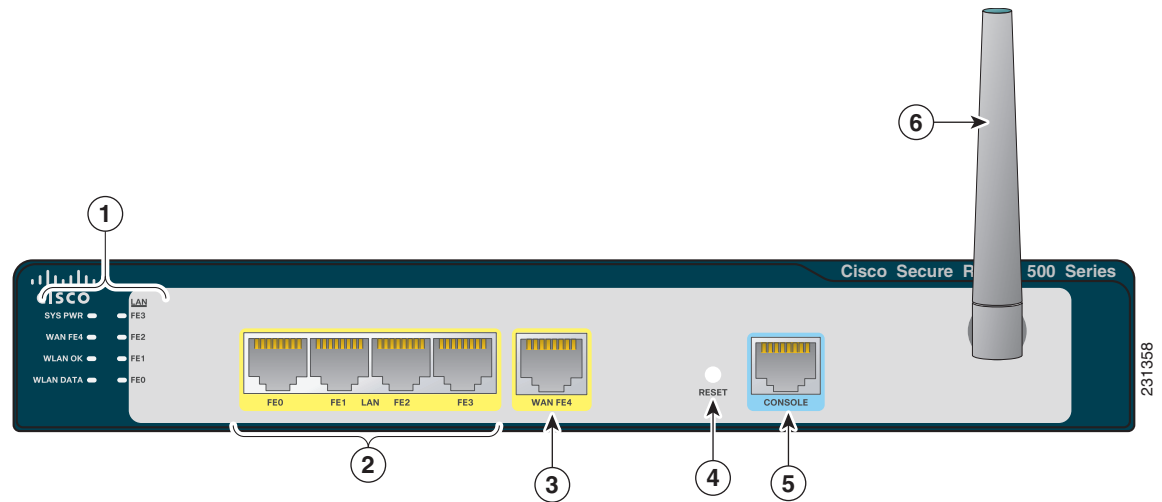
The Cisco Secure Router 520 Ethernet-to-Ethernet routers can connect a small business or a teleworker to a corporate LAN or to the Internet through an Internet service provider (ISP) over a broadband or Ethernet connection. These switch-capable routers provide a 4-port Fast Ethernet switch for the LAN. The routers are capable of bridging and multiprotocol routing between LAN and WAN ports.

Two router models are available:

- Cisco Secure Router 520 Ethernet-to-Ethernet (without wireless functionality).
- Cisco Secure Router 520 Ethernet-to-Ethernet Wireless (with wireless functionality). The wireless router supports the use of a single 2.4-GHz antenna.

Figure 1-1 shows the front panel of the Cisco Secure Router 520 Ethernet-to-Ethernet wireless router. The front panel contains the LEDs, ports, reset button, and antenna. The antenna is available only with the wireless router.

Figure 1-1 Cisco Secure Router 520 Ethernet-to-Ethernet Wireless Router—Front Panel



1	LEDs	2	Four 10/100BASE-T RJ-45 Fast Ethernet switch ports
3	10/100BASE-T RJ-45 WAN Fast Ethernet port	4	Reset button
5	RJ-45 console port	6	Antenna (wireless router only)

Figure 1-2 shows the back panel of the Cisco Secure Router 520 Series router. It contains the Kensington security slot for securing the router and the input jack for the AC adapter. The back panel is identical for all the Cisco Secure Router 520 Series routers.

Figure 1-2 Cisco Secure Router 520 Series Router—Back Panel



1	Kensington security slot	2	Input jack for the AC adapter
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Cisco Secure Router 520 ADSL-over-POTS Routers

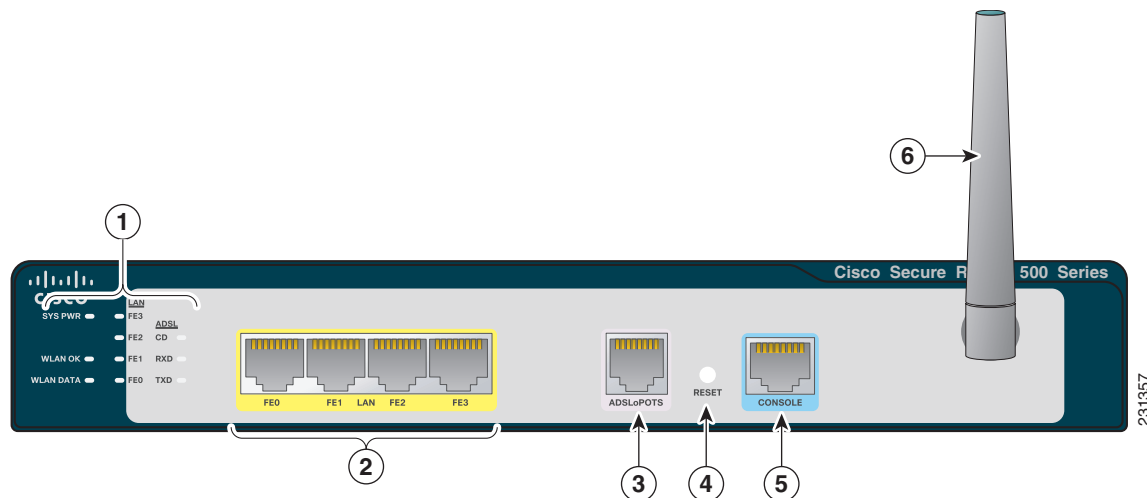
The Cisco Secure Router 520 ADSL-over-POTS routers use an asymmetric digital subscriber line (ADSL) over plain old telephone service (POTS). These secure routers have an integrated 4-port Fast Ethernet switch for the LAN and an ADSL-over-POTS physical interface for the WAN. This feature allows the router to connect a small business or a teleworker to a corporate LAN and to the Internet.

Two router models are available:

- Cisco Secure Router 520 ADSL-over-POTS (without wireless functionality).
- Cisco Secure Router 520 ADSL-over-POTS Wireless (with wireless functionality). The wireless router supports the use of a single 2.4-GHz antenna.

Figure 1-3 shows the front panel of the Cisco Secure Router 520 ADSL-over-POTS wireless router. The front panel contains the LEDs, ports, reset button, and antenna. The antenna is available only with the wireless router.

Figure 1-3 Cisco Secure Router 520 ADSL-over-POTS Wireless Router—Front Panel



1	LEDs	2	Four 10/100BASE-T RJ-45 Fast Ethernet switch ports
3	ADSL-over-POTS port	4	Reset button
5	RJ-45 console port	6	Antenna (wireless router only)

The back panel is identical for all the Cisco Secure Router 520 Series routers (see [Figure 1-2 on page 1-3](#)). The back panel contains the Kensington security slot for securing the router and the input jack for the AC adapter.

Cisco Secure Router 520 ADSL-over-ISDN Routers

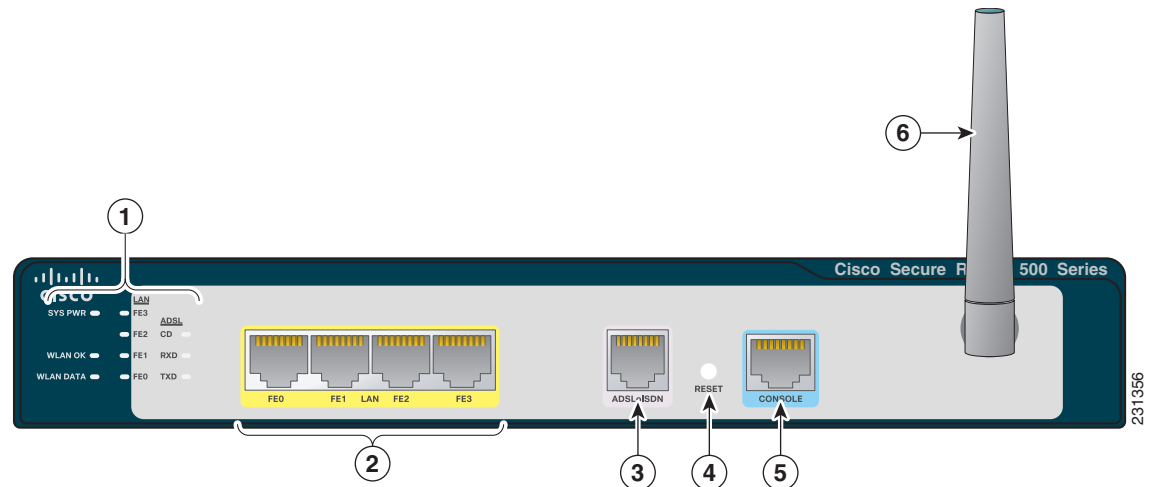
The Cisco Secure Router 520 ADSL-over-ISDN router is a routing device that uses an asymmetric digital subscriber line (ADSL) over integrated services digital network (ISDN). These routers have an integrated 4-port Fast Ethernet switch for connecting to the LAN and an ADSL-over-ISDN physical interface for connecting to the WAN. This feature allows the router to connect a small business or a teleworker to a central office or an Internet service provider (ISP) over an ADSL interface.

Two router models are available:

- Cisco Secure Router 520 ADSL-over-ISDN (without wireless functionality).
- Cisco Secure Router 520 ADSL-over-ISDN Wireless (with wireless functionality). The wireless router supports the use of a single 2.4-GHz antenna.

Figure 1-4 shows the front panel of the Cisco Secure Router 520 ADSL-over-ISDN wireless router. The front panel contains the LEDs, ports, reset button, and antenna. The antenna is only available with the wireless router.

Figure 1-4 Cisco Secure Router 520 ADSL-over-ISDN Wireless Router—Front Panel



1	LEDs	2	Four 10/100BASE-T RJ-45 Fast Ethernet switch ports
3	ADSL-over-ISDN port	4	Reset button
5	RJ-45 console port	6	Antenna (wireless router only)

The back panel is identical for all the Cisco Secure Router 520 Series routers (see [Figure 1-2 on page 1-3](#)). The back panel contains the Kensington security slot for securing the router and the input jack for the AC adapter.

Hardware Features

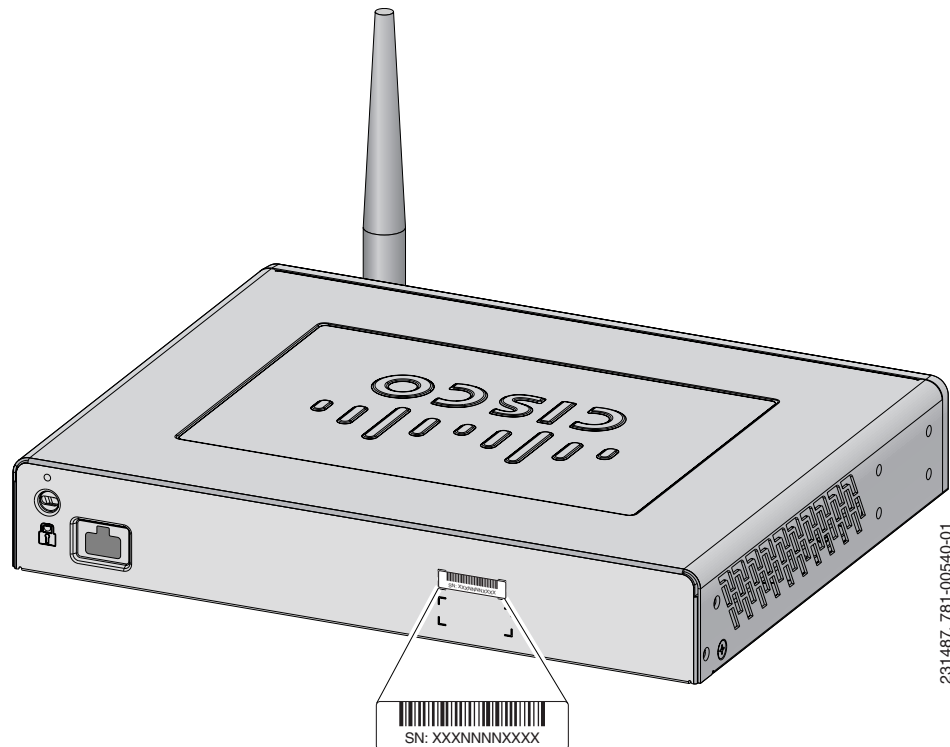
The following sections provide information about the hardware features of the Cisco Secure Router 520 Series routers:

- [Serial Number Label Location](#)
- [LED Indicators on the Routers](#)
- [Integrated 802.11b/g Radio Module—Wireless Routers Only](#)
- [Router Memory](#)
- [Router Hardware Security](#)
- [Feature Summary](#)

Serial Number Label Location

Figure 1-5 shows the serial number label, which is located on the back of the Cisco Secure Router 520 Series routers.

Figure 1-5 Serial Number Location on the Back of the Cisco Secure Router 520 Series Router



LED Indicators on the Routers

The LEDs, which are located on the router's front panel, indicate the status or activity on the router. Table 1-1 describes the LEDs.

Table 1-1 LED Indicators on the Routers

LED	Color	Description	Router
SYS PWR	Green	On when DC power is being supplied to the router. The light blinks if an error occurs during bootup.	All Cisco Secure Router 520 Series routers
WAN FE4	Green	On when a device connects to the Ethernet WAN FE4 port. Blinks when the Ethernet WAN FE4 port receives or sends data, or when data passes through the port.	Cisco Secure Router 520 Ethernet-to-Ethernet router
WLAN OK	Green	Shows whether the wireless link status is operational. Blinks if no client is associated. Solid green if at least one client is associated.	Cisco Secure Router 520 Series wireless routers only

Table 1-1 LED Indicators on the Routers (continued)

LED	Color	Description	Router
WLAN DATA	Green	Wireless LAN link traffic. Blinks when there is traffic on the wireless LAN. Off when there is no traffic.	Cisco Secure Router 520 Series wireless routers only
LAN			
FE0	Green	On when a device connects to the Ethernet LAN 0 port. Blinks when the Ethernet LAN 0 port receives or sends data, or when data passes through the port.	All Cisco Secure Router 520 Series routers
FE1	Green	On when a device connects to the Ethernet LAN 1 port. Blinks when the Ethernet LAN 1 port receives or sends data, or when data passes through the port.	All Cisco Secure Router 520 Series routers
FE2	Green	On when a device connects to the Ethernet LAN 2 port. Blinks when the Ethernet LAN 2 port receives or sends data, or when data passes through the port.	All Cisco Secure Router 520 Series routers
FE3	Green	On when a device connects to the Ethernet LAN 3 port. Blinks when the Ethernet LAN 3 port receives or sends data, or when data passes through the port.	All Cisco Secure Router 520 Series routers
ADSL			
ADSL CD	Green	On if the ADSL carrier detects status and connects to the digital subscriber line access multiplexer (DSLAM).	Cisco Secure Router 520 ADSL-over-POTS and Cisco Secure Router 520 ADSL-over-ISDN routers
ADSL RXD	Green	Blinks when the ADSL interface receives data. Off when there is no data.	Cisco Secure Router 520 ADSL-over-POTS and Cisco Secure Router 520 ADSL-over-ISDN routers
ADSL TXD	Green	Blinks when the ADSL interface transmits data. Off when no data is being uploaded.	Cisco Secure Router 520 ADSL-over-POTS and Cisco Secure Router 520 ADSL-over-ISDN routers

Integrated 802.11b/g Radio Module—Wireless Routers Only

The Cisco Secure Router 520 Series wireless router has an integrated IEEE 802.11b/g radio module that operates as a wireless access point in infrastructure mode. The wireless routers have one reverse-polarity threaded Neill-Concelman (RP-TNC) connector on the front panel on the right side. The swivel-mount, dipole, 2.4-GHz antenna, which is shipped with the router, connects to the RP-TNC connector to operate the 802.11b/g radio module. For more information, see the *Cisco 2.4-GHz Swivel-Mount Dipole Antenna (23.7786.51)* document.

You can configure the wireless operations by using the Cisco IOS command-line interface (CLI). For details, see the *Cisco Secure Router 520 Series Software Configuration Guide*.

Router Memory

The Cisco Secure Router 520 Series routers support the following types of memory:

- [Flash Memory](#)
- [SDRAM](#)

Flash Memory

Flash memory stores the image of the ROMMON boot code, the Cisco IOS software, and the router configuration file. By default, the router ships with 36 MB of flash memory, with no option for expansion. The router has enough memory to support the Cisco IOS Advanced IP Services image.

SDRAM

SDRAM stores the Cisco IOS software and provides memory for data that is created during packet processing. The router provides 128 MB of onboard SDRAM.

Router Hardware Security

Each Cisco Secure Router 520 Series router has a Kensington security slot on the back panel. To secure the router to a desktop or other surface, use the Kensington lockdown equipment.

Feature Summary

[Table 1-2](#) summarizes the features of the Cisco Secure Router 520 Series routers.

Table 1-2 Cisco Secure Router 520 Series Feature Summary

Feature	Description
Security features	Provides advanced security features, including secure VPN access and comprehensive threat defense with Cisco IOS Firewall, IPS, and URL filtering. The Cisco Secure Router 520 Series routers also provides dynamic routing and advanced QoS features.
IPsec hardware accelerator	The security processor implements symmetric key encryption, public key encryption, authentication, and data compression in hardware.
Integrated 802.11b/g radio module	(Wireless routers only) Provides connectivity to a wireless LAN using IEEE 802.11b/g standards. Enables the router to act as an access point (AP) in infrastructure mode.
Flash memory	36 MB of flash memory (default) with no option for expansion. The router has enough memory to support the Cisco IOS Advanced IP Services image.
SDRAM	128 MB of SDRAM on board.
Dying gasp	Detects whether the router is about to lose power, and then sends a signal to warn the digital subscriber line access multiplexer (DSLAM) about the impending line drop.

Table 1-2 Cisco Secure Router 520 Series Feature Summary (continued)

Feature	Description
Autosensing function	Eliminates the need for a crossover cable and allows the router to detect medium-dependent interface (MDI) in normal mode or medium-dependent interface in crossover mode (MDIX) in any other PC or hub by means of a straight-through cable or a crossover cable. The router is capable of bridging and multiprotocol routing between the LAN and WAN ports.
10BASE-T/100BASE-T built-in switch ports	Provides connection to 10/100BASE T (10/100-Mbps) Ethernet networks. Compatible with 10/100-Mbps devices.
Fast Ethernet WAN port	Cisco Secure Router 520 Ethernet-to-Ethernet routers only. Provides connection to 10/100BASE T. Can be connected to other network devices, such as cable modem and routers.
ADSL-over-POTS port	Cisco Secure Router 520 ADSL-over-POTS routers only. Provides connection to an ADSL network. Does not support the autoswitch function.
ADSL-over-ISDN port	Cisco Secure Router 520 ADSL-over-ISDN routers only. Provides connection to an ADSL-over-ISDN network. Does not support the autoswitch function.
Console port	Provides connection to a terminal or PC for software configuration or for troubleshooting using the CLI. The console port may be configured as a virtual auxiliary port (using the CLI) for dial backup and remote management.
Router Reset button	Resets the router configuration to the factory default.
Wall-mount feature	Allows the router to be mounted on a wall or vertical surface.
Rack-mount feature	Allows use of brackets to mount the router in a 19-inch rack.
Kensington security slot	Allows the router to be secured to a desktop or other surface by using the Kensington lockdown equipment.

Regulatory Compliance

For compliance and safety information, see the *Regulatory Compliance and Safety Information for Cisco Secure Router 500 Series*.



CHAPTER 2

Preinstallation Information

This chapter provides information about safety, unpacking the router, and preparing the Cisco Secure Router 520 Series router for installation. It contains the following sections:

- [Safety Warnings and Guidelines, page 2-1](#)
- [Preventing Damage to the Router, page 2-3](#)
- [Unpacking the Box, page 2-4](#)
- [Preparing for Installation, page 2-5](#)
- [What to Do Next, page 2-5](#)

Safety Warnings and Guidelines

This section provides the safety warnings and guidelines for working with wireless and nonwireless routers. Before installing the router, read the following warnings:



Warning

Read the installation instructions before connecting the system to the power source. Statement 1004



Warning

No user-serviceable parts inside. Do not open. Statement 1073



Warning

Installation of the equipment must comply with local and national electrical codes. Statement 1074



Warning

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 120 VAC, 15A U.S. (240 VAC, 10A international)
Statement 1005



Warning

To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables. Statement 1021

**Warning**

Do not work on the system or connect or disconnect cables during periods of lightning activity.

Statement 1001

**Warning**

Ultimate disposal of this product should be handled according to all national laws and regulations.

Statement 1040

**Warning**

To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord. Statement 1023

**Warning**

Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units. Statement 12

**Warning**

During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94

**Warning**

Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43

**Warning**

This equipment is not designed for making emergency telephony calls when the power fails. Alternative arrangements should be made for access to emergency services. Access to emergency services can be affected by any call-barring function of this equipment. Statement 199

**Caution**

Inline power circuits provide current through the communication cable. Use the cable provided by Cisco Systems or a communication cable with a minimum of 24 AWG.

Additional Warnings for Wireless Routers

**Warning**

In order to comply with FCC radio frequency (RF) exposure limits, antennas should be located at a minimum of 7.9 inches (20 cm) or more from the body of all persons. Statement 332

**Warning**

Do not operate your wireless network device near unshielded blasting caps or in an explosive environment unless the device has been modified to be especially qualified for such use.

Statement 245B

General Safety Guidelines for Wireless Routers

Use the following guidelines for wireless routers:

- Do not touch or move the antenna while the unit is transmitting or receiving data.
- Do not hold any component containing a radio so that the antenna is very close to or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- The use of wireless devices in hazardous locations is limited to the constraints posed by the local codes, national codes, and safety directors of such environments.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) is a transfer of electrostatic charge between bodies of different electrostatic potentials, such as an operator and a piece of electrical equipment. It occurs when electronic components are improperly handled, and it can damage equipment and impair electrical circuitry. Electrostatic discharge is more likely to occur in the presence of synthetic fibers and dry atmosphere.

Always use the following ESD-prevention procedures when removing and replacing components:

Step 1 Wear an ESD-preventive wrist strap that you provide, ensuring that it makes good skin contact.



Caution

To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. Always follow the warnings and guidelines in this section.

Step 2 Do not touch any exposed contact pins or connector shells of interface ports that do not have a cable attached.

If cables are connected at one end only, do not touch the exposed pins at the unconnected end of the cable. This device is intended for use in residential and commercial environments only.



Caution

Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohm).

Preventing Damage to the Router

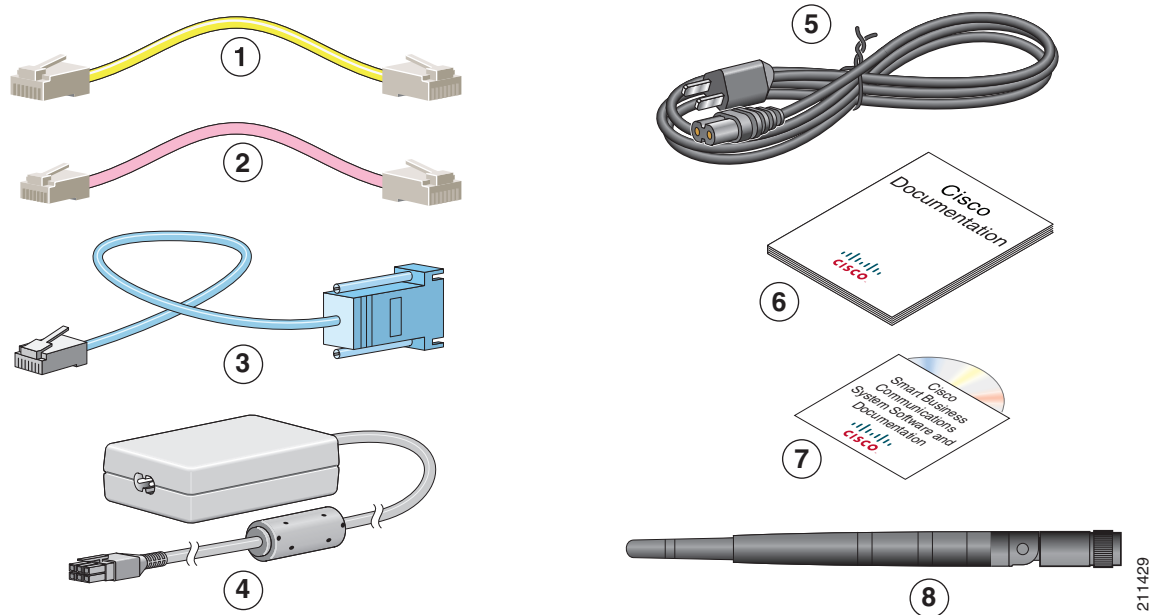
Follow these guidelines when connecting devices to your router:

- Connect the color-coded cables supplied by Cisco Systems to the color-coded ports on the front panel.
- If you must supply your own cable, see the cabling specifications in [Appendix A, “Specifications.”](#) If this appendix does not provide specifications for a particular cable, we strongly recommend that you order the cable from Cisco Systems.

Unpacking the Box

Figure 2-1 shows the items included with the Cisco Secure Router 520 Series routers.

Figure 2-1 Items Included with the Cisco Secure Router 520 Series Routers



1	Yellow Ethernet cable	2	Lavender DSL cable (optional)
3	Light blue console cable	4	AC adapter
5	Black power cord for adapter	6	Product documentation
7	Cisco Smart Business Communications System CD—Includes Cisco Configuration Assistant software and documentation and an evaluation version of the Cisco Monitor Manager Director	8	Swivel-mount dipole antenna (wireless router only)
Note Might not be included with all routers.			

Table 2-1 lists the quantity of each item that is shipped with the Cisco Secure Router 520 Series routers. Make sure that you have received all of the items. If any items are missing or damaged, contact your customer service representative.

Table 2-1 Items Shipped with the Cisco Secure Router 520 Series Routers

Item	Cisco Secure Router 520 Ethernet-to-Ethernet	Cisco Secure Router 520 ADSL-over-POTS	Cisco Secure Router 520 ADSL-over-ISDN
Ethernet cable(s)	1	1	1
DSL ¹ cable	—	1 ²	1 ³
Console cable	1	1	1
Console-auxiliary ⁴ cable	Optional	Optional	Optional

Table 2-1 Items Shipped with the Cisco Secure Router 520 Series Routers (continued)

Item	Cisco Secure Router 520 Ethernet-to-Ethernet	Cisco Secure Router 520 ADSL-over-POTS	Cisco Secure Router 520 ADSL-over-ISDN
Power adapter	1	1	1
Power cord ⁵	1	1	1
Cisco documentation ⁶	1	1	1
Swivel-mount dipole antenna (wireless routers only)	1	1	1

1. DSL = digital subscriber line. Used for an asynchronous digital subscriber line (ADSL).
2. An RJ-11—to—RJ-11 straight-through cable is shipped, unless you have requested an RJ-11—to—RJ-11 crossover cable.
3. An RJ-11—to—RJ-11 straight-through cable is shipped, unless you have requested an RJ-11—to—RJ-11 crossover cable or an RJ-11—to—RJ-45 cable.
4. The console-auxiliary cable is used to connect the router console port to an async modem for dial backup or remote management.
5. Power cords are ordered as applicable to country or geographic region.
6. Includes the *Cisco Regulatory Compliance and Safety Information Roadmap* and the *Readme First for Cisco Secure Router 520 Series* documents.

Preparing for Installation

Before installing the router and connecting devices to it, follow these steps:

-
- Step 1** Obtain a broadband or Ethernet connection from your service provider.
 - Step 2** Remove the cables and product documentation from the plastic bag. Remove the router power adapter and the black power cord from the accessory kit.
 - Step 3** If you ordered a wireless router, remove the antenna from the box.
 - Step 4** Gather the Ethernet devices to be connected to the router: servers, workstations, or PCs. Make sure that there is a network interface card (NIC) in each device for connecting to the Ethernet ports.
 - Step 5** If you plan to configure the software by using Cisco IOS commands and the console port, provide an ASCII terminal or a PC that is running terminal emulation software to connect to the console port.
 - Step 6** If you plan to connect a modem, provide the modem and modem cable.
 - Step 7** If you plan to use the cable-lock feature, provide a Kensington or equivalent locking cable.
 - Step 8** Read the safety warnings (see the [“Safety Warnings and Guidelines”](#) section on page 2-1) and information about preventing damage to the router (see the [“Preventing Damage to the Router”](#) section on page 2-3).
-

What to Do Next

Mount the router by following the instructions in [Chapter 3, “Router Mounting Procedures.”](#)



CHAPTER 3

Router Mounting Procedures

This chapter provides the procedures for mounting the Cisco Secure Router 520 Series routers. It contains the following sections:

- [Connecting a Radio Antenna to a Wireless Router, page 3-1](#)
- [Placing the Router on a Desktop, page 3-1](#)
- [Mounting the Router on a Wall, page 3-2](#)
- [Mounting the Router in a Rack, page 3-3](#)
- [What to Do Next, page 3-5](#)

Connecting a Radio Antenna to a Wireless Router

Before you mount the wireless router on a wall or rack, we recommend that you first connect the antenna to the router. It is difficult to connect the antenna after the router is mounted.

To connect the antenna to a router, follow these steps:

-
- | | |
|---------------|--|
| Step 1 | Attach the antenna to the reverse-polarity threaded Neill-Concelman (RP-TNC) connector on the front of the router, and then tighten the antenna. |
| Step 2 | Orient the antenna vertically (straight up). |
-

Placing the Router on a Desktop



Caution

The router installation must allow unrestricted airflow for cooling. When placing the router on a desktop, make sure there is at least 1 in. (2.54 cm) of clear space between the cooling inlet and exhaust vents.



Caution

Do not place any items that weigh more than 10 lb (4.5 kg) on top of the router.

To install the router on a desktop, table, or other flat surface, follow these steps:

- Step 1** Place the unit upside-down on the flat surface.
- Step 2** Attach the four rubber pads to the recessed areas on the bottom of the unit.
- Step 3** Place the unit right-side-up on the flat surface.
- Step 4** If you have a wireless router, connect the radio antenna to the router (see the [“Connecting a Radio Antenna to a Wireless Router”](#) section on page 3-1).
- Step 5** Place the power supply unit on a desktop near an AC power source. Do not stack the power supply on the router.

Mounting the Router on a Wall

You can mount the Cisco Secure Router 520 Series router on a wall or other vertical surface. There are two mounting-screw holes on the bottom of the router for mounting the unit. [Figure 3-1](#) shows the mounting-screw holes.

Figure 3-1 Mounting-Screw Holes on the Bottom of the Cisco Secure Router 520 Series Router



1	Front panel facing upward	2	Mounting-screw holes
---	---------------------------	---	----------------------

**Warning**

This unit is intended to be mounted on a wall. Please read the wall mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system. Statement 248

Guidelines for Mounting the Router on a Wall

- When choosing a location for mounting the router on a wall, consider cable limitations and wall structure.
- Mount the router with the front panel facing upward. Make sure to mount the router low enough so that you can see the LEDs.
- Make sure that the power supply rests on a horizontal surface such as the floor or a table. If the power supply is not supported, the strain on the power adapter cable could cause it to disconnect from the router.
- Do not install the router or its power supply next to a heat source of any kind, including heating vents.

You can mount the router on a hollow wall or a wall stud. To mount the router, follow these steps:

-
- Step 1** If you have a wireless router, connect the radio antenna to the router (see the [“Connecting a Radio Antenna to a Wireless Router”](#) section on page 3-1).
- Step 2** Position the router on the wall to determine where to attach the two mounting screws. Make sure the distance between the screws is 8.25 in. (see [Figure 3-1 on page 3-2](#)).
- Step 3** Mount the router on a wall stud or a hollow wall. Perform one of the following, as appropriate:
- To mount the router on a wall stud, attach two #10 wood screws (round or pan-head) with #10 washers, or two #10 washer-head screws to the wall. Make sure that the screws are long enough to penetrate at least 3/4 in. (20 mm) into the supporting wood or into a metal wall stud.
 - To mount the router on a hollow wall, attach two wall anchors with washers to the wall. Make sure that the wall is at least 1/2 in. (12.7 mm) thick and that the wall anchors and washers are a size suitable for the wall to which they are attached.
- Step 4** Insert the wood screws or wall anchors (whichever you used) into the mounting-screw holes on the router. Mount the router vertically, with the front panel facing upward and the connection to the power cord facing downward.
-

Mounting the Router in a Rack

The Cisco Secure Router 520 Series routers can be front-mounted in 19-inch racks only. The mounting brackets are not included with the router. If you choose to mount the router into a rack, you must order the mounting brackets separately.

**Warning**

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

**Caution**

The router installation must allow unrestricted airflow for cooling. When mounting the router in a rack, make sure there is at least 1 in. (2.54 cm) of clear space between the cooling inlet and exhaust vents.

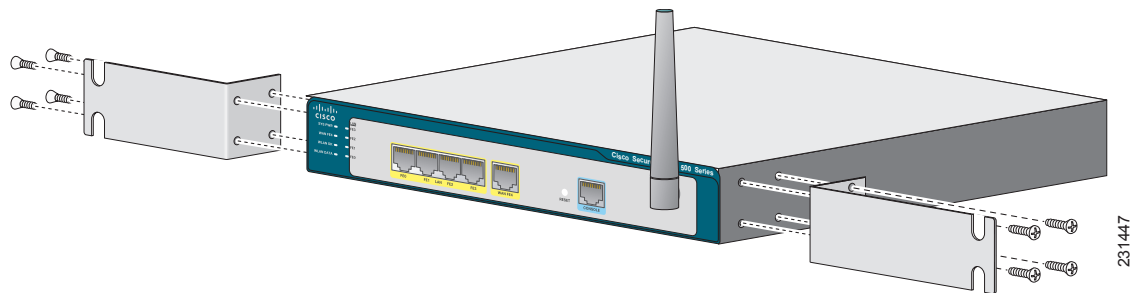
To attach brackets for mounting a Cisco Secure Router 520 Series router in a 19-inch rack, follow these steps:

- Step 1** If you have a wireless router, first connect the radio antenna to the router (see the [“Connecting a Radio Antenna to a Wireless Router”](#) section on page 3-1).
- Step 2** Using a number 2 Phillips screwdriver and four screws, install a bracket to each side of the router as shown in [Figure 3-2](#).

**Note**

Do not overtorque the screws. The recommended torque is 6 to 8 in-lb (0.7 to 0.9 N-m).

Figure 3-2 Attaching Rack-Mount Brackets to a Cisco Secure Router 520 Series Router



- Step 3** Using two pairs of screws on each side (supplied with the rack) attach the router to a 19-inch rack. Install the lower pair of screws on each side first. Then, with the brackets resting on the lower screws, install the upper pair of screws on each side.

**Tip**

The screw slots in the brackets are spaced to line up with every second pair of screw holes in the rack. When the correct screw holes are used, the small threaded holes in the brackets line up with unused screw holes in the rack. If the small holes do not line up with the rack holes, you must raise or lower the brackets to the next rack hole.

What to Do Next

Install the router by following the instructions in [Chapter 4, “Router Installation.”](#)



CHAPTER 4

Router Installation

This chapter provides the procedures for cabling and installing a Cisco Secure Router 520 Series router. The chapter contains the following sections:

- [Typical Installation, page 4-1](#)
- [Connecting a Server, PC, or Workstation, page 4-6](#)
- [Connecting an External Ethernet Switch \(Optional\), page 4-7](#)
- [Connecting a Broadband Modem, page 4-8](#)
- [Connecting an ADSL Line—ADSLoPOTS Port, page 4-9](#)
- [Connecting an ADSL Line—ADSLoISDN Port, page 4-10](#)
- [Connecting the AC Adapter, page 4-12](#)
- [Connecting a Terminal or PC to the Console Port, page 4-14](#)
- [Connecting an Asynchronous Modem to the Console Port, page 4-14](#)
- [Verifying Router Operation, page 4-16](#)
- [What to Do Next, page 4-16](#)



Note

Before you start the cabling procedure, do the following:

- Read the safety warnings and guidelines in the [“Safety Warnings and Guidelines”](#) section on [page 2-1](#).
- Mount the router as described in [Chapter 3, “Router Mounting Procedures.”](#)

Typical Installation

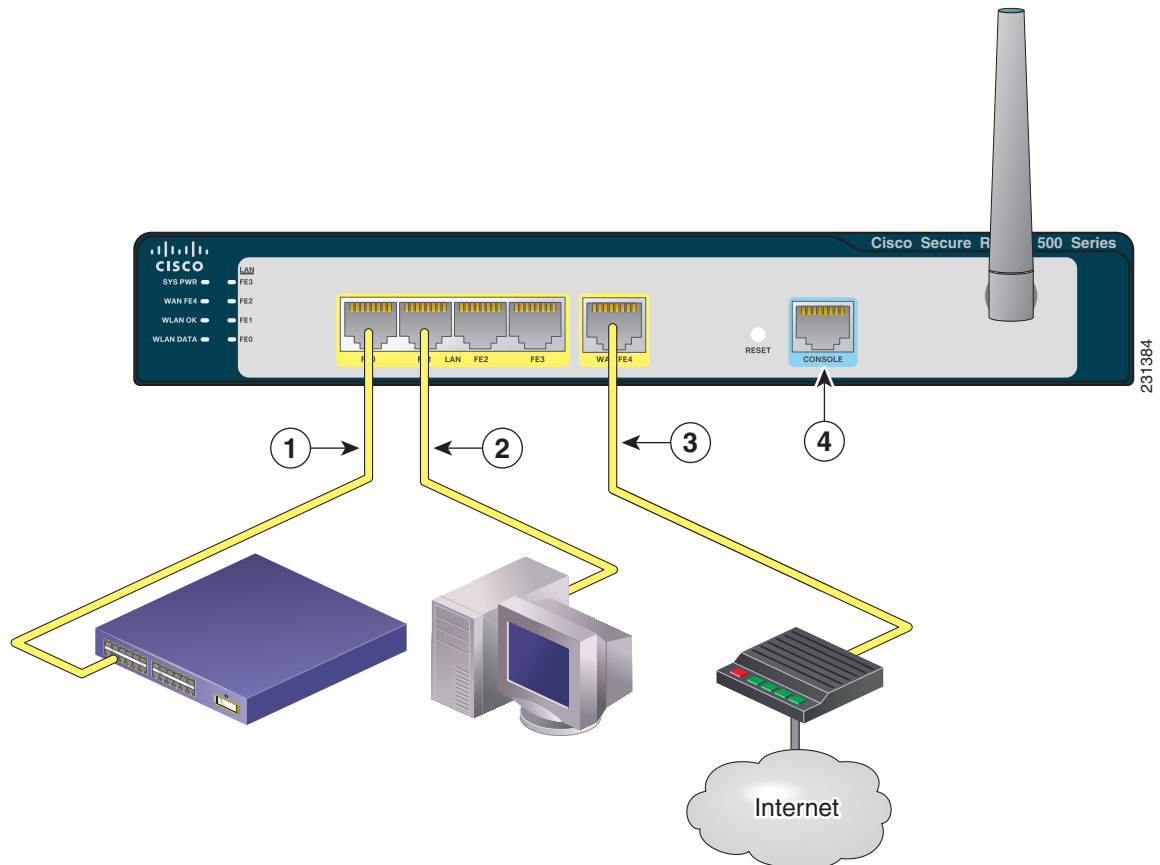
The following sections describe and depict a typical installation for each of the Cisco Secure Router 520 Series routers:

- [Installing the Cisco Secure Router 520 Ethernet-to-Ethernet Router, page 4-2](#)
- [Installing the Cisco Secure Router 520 ADSL-over-POTS Router, page 4-3](#)
- [Installing the Cisco Secure Router 520 ADSL-over-ISDN Router, page 4-5](#)

Installing the Cisco Secure Router 520 Ethernet-to-Ethernet Router

Figure 4-1 shows a typical installation for the Cisco Secure Router 520 Ethernet-to-Ethernet router. The figure shows the front panel of the router.

Figure 4-1 Typical Installation of a Cisco Secure Router 520 Ethernet-to-Ethernet Router



1	Ethernet connection to an external switch	2	Ethernet connection to a PC
3	WAN connection to the Internet using a broadband modem	4	Console port

To install a Cisco Secure Router 520 Ethernet-to-Ethernet router, follow these steps:

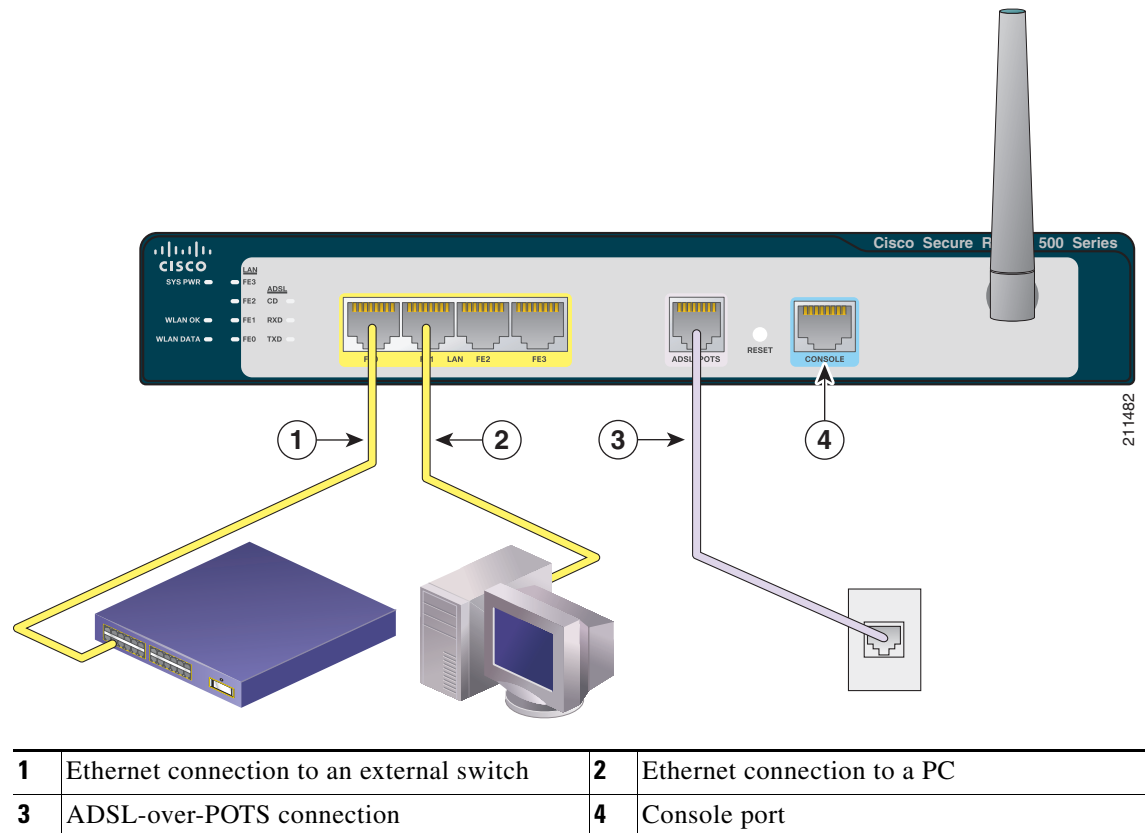
- Step 1** If you have a wireless router, first connect the radio antenna to the router. See the [“Connecting a Radio Antenna to a Wireless Router”](#) section on page 3-1.
- Step 2** Connect the server, PC, or workstation to the router. See the [“Connecting a Server, PC, or Workstation”](#) section on page 4-6.
- Step 3** (Optional) If you need to connect more than four PCs, connect an external Ethernet switch to the router’s built-in switch. See the [“Connecting an External Ethernet Switch \(Optional\)”](#) section on page 4-7.
- Step 4** Connect a broadband modem to the router for Internet connection. See the [“Connecting a Broadband Modem”](#) section on page 4-8.

- Step 5** Connect the AC adapter to the router. See the [“Connecting the AC Adapter”](#) section on page 4-12.
- Step 6** To configure the router software by using the command-line interface (CLI) or to troubleshoot problems, connect a terminal or PC to the console port. See the [“Connecting a Terminal or PC to the Console Port”](#) section on page 4-14.
- Step 7** (Optional) To use the console port as a backup link to the WAN port in case the ADSL service goes down, connect an analog modem to the console port. See the [“Connecting an Asynchronous Modem to the Console Port”](#) section on page 4-14.

Installing the Cisco Secure Router 520 ADSL-over-POTS Router

Figure 4-2 shows a typical installation for the Cisco Secure Router 520 ADSL-over-POTS router. The figure shows the front panel of the router.

Figure 4-2 Typical Installation of a Cisco Secure Router 520 ADSL-over-POTS Router



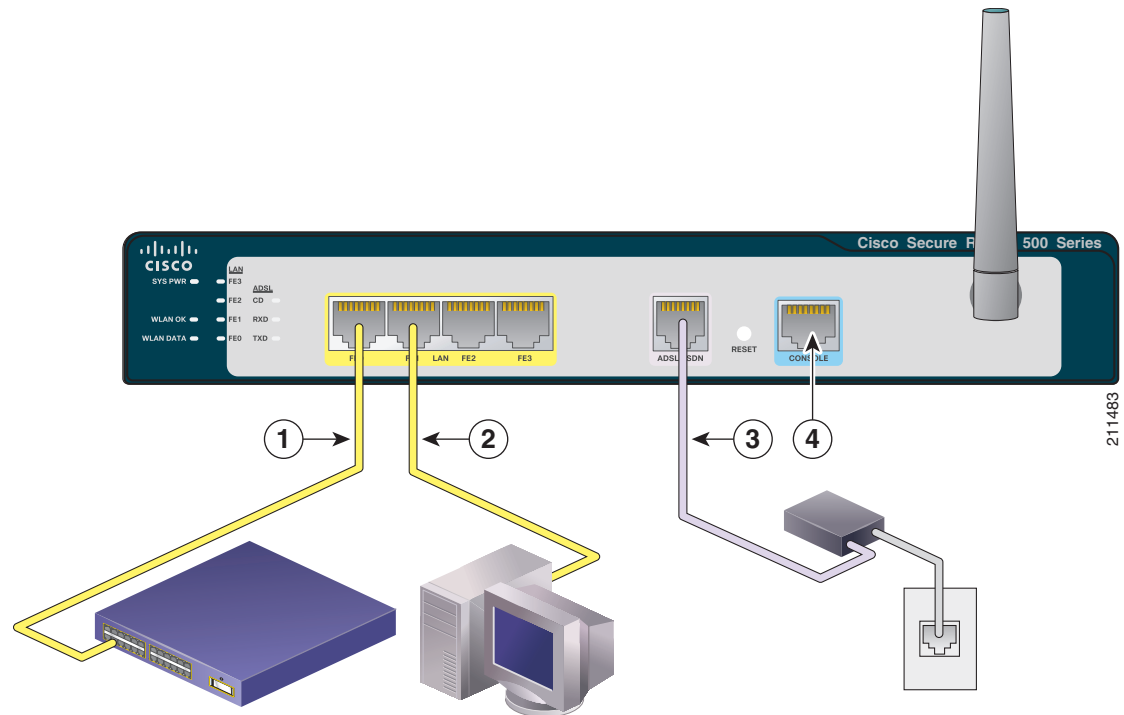
To install a Cisco Secure Router 520 ADSL-over-POTS router, follow these steps:

-
- Step 1** If you have a wireless router, first connect the radio antenna to the router. See the [“Connecting a Radio Antenna to a Wireless Router”](#) section on page 3-1.
 - Step 2** Connect the server, PC, or workstation to the router. See the [“Connecting a Server, PC, or Workstation”](#) section on page 4-6.
 - Step 3** (Optional) If you need to connect more than four PCs, connect an external Ethernet switch to the router’s built-in switch. See the [“Connecting an External Ethernet Switch \(Optional\)”](#) section on page 4-7.
 - Step 4** Connect the ADSL line. See the [“Connecting an ADSL Line—ADSLoPOTS Port”](#) section on page 4-9.
 - Step 5** Connect the AC adapter to the router. See the [“Connecting the AC Adapter”](#) section on page 4-12.
 - Step 6** To configure the router software by using the command-line interface (CLI) or to troubleshoot problems, connect a terminal or PC to the console port. See the [“Connecting a Terminal or PC to the Console Port”](#) section on page 4-14.
 - Step 7** (Optional) To use the console port as a backup link to the WAN port in case the ADSL service goes down, connect an analog modem to the console port. See the [“Connecting an Asynchronous Modem to the Console Port”](#) section on page 4-14.
-

Installing the Cisco Secure Router 520 ADSL-over-ISDN Router

Figure 4-3 shows a typical installation for the Cisco Secure Router 520 ADSL-over-ISDN router. The figure shows the front panel of the router.

Figure 4-3 Typical Installation of a Cisco Secure Router 520 ADSL-over-ISDN Router



1	Ethernet connection to an external switch	2	Ethernet connection to a PC
3	ADSL-over-ISDN connection	4	Console port

To install the Cisco Secure Router 520 ADSL-over-ISDN router, follow these steps:

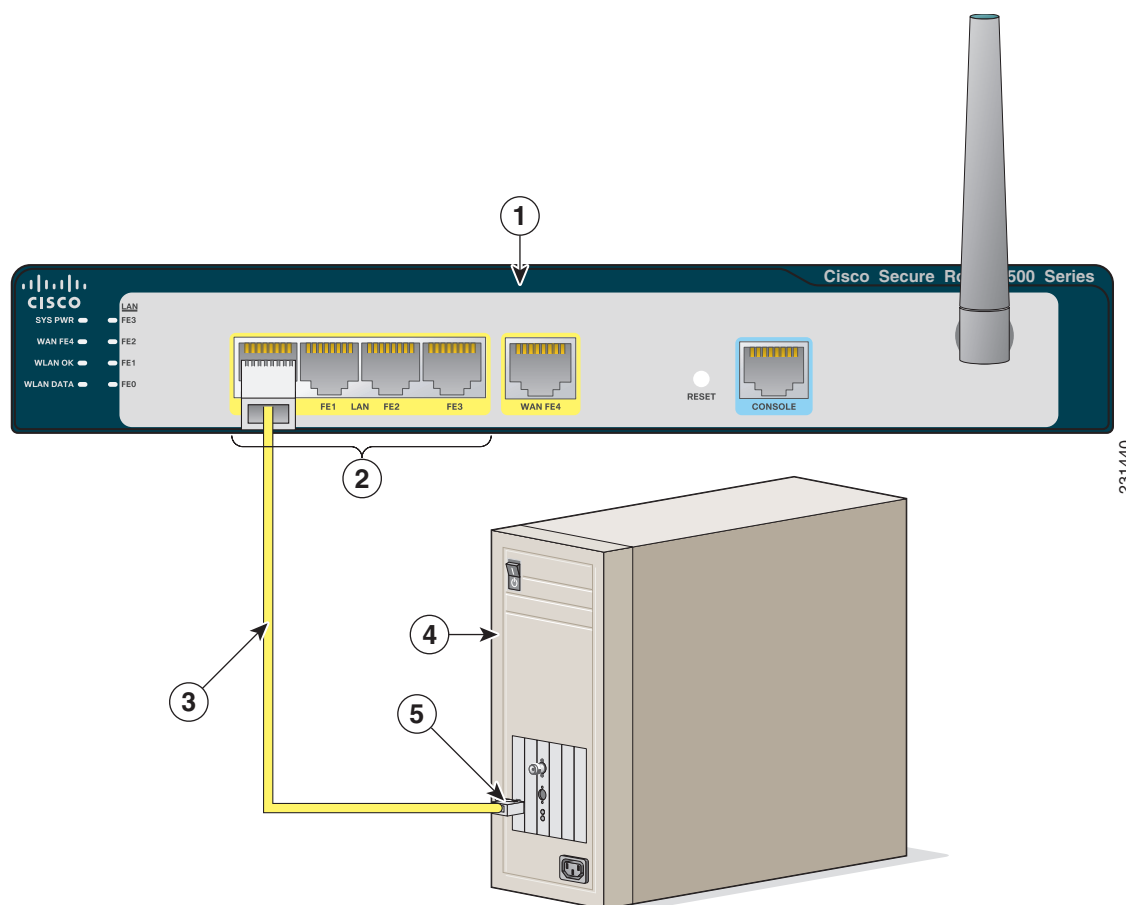
- Step 1** If you have a wireless router, first connect the radio antenna to the router. See the [“Connecting a Radio Antenna to a Wireless Router”](#) section on page 3-1.
- Step 2** Connect the server, PC, or workstation to the router. See the [“Connecting a Server, PC, or Workstation”](#) section on page 4-6.
- Step 3** (Optional) If you need to connect more than four PCs, connect an external Ethernet switch to the router’s built-in switch. See the [“Connecting an External Ethernet Switch \(Optional\)”](#) section on page 4-7.
- Step 4** Connect the ADSL line. See the [“Connecting an ADSL Line—ADSL-over-ISDN Port”](#) section on page 4-10.
- Step 5** Connect the AC adapter to the router. See the [“Connecting the AC Adapter”](#) section on page 4-12.

- Step 6** To configure the router software by using the command-line interface (CLI) or to troubleshoot problems, connect a terminal or PC to the console port. See the [“Connecting a Terminal or PC to the Console Port”](#) section on page 4-14.
- Step 7** (Optional) To use the console port as a backup link to the WAN port in case the ADSL service goes down, connect an analog modem to the console port. See the [“Connecting an Asynchronous Modem to the Console Port”](#) section on page 4-14.

Connecting a Server, PC, or Workstation

Figure 4-4 shows a Cisco Secure Router 520 Ethernet-to-Ethernet router connected to a PC. Although the figure shows a Cisco Secure Router 520 Ethernet-to-Ethernet router, this procedure applies to all Cisco Secure Router 520 Series routers.

Figure 4-4 Connecting a Server, PC, or Workstation



1	Router	2	Built-in Ethernet switch port on the router
3	Yellow Ethernet cable	4	PC
5	RJ-45 port on the network interface card (NIC)		

To connect a server, PC, workstation, or other Ethernet device to a built-in Ethernet switch port on the router, follow these steps.



Caution Do not turn on the server, PC, workstation, or other Ethernet device until you have completed all connections to the router.

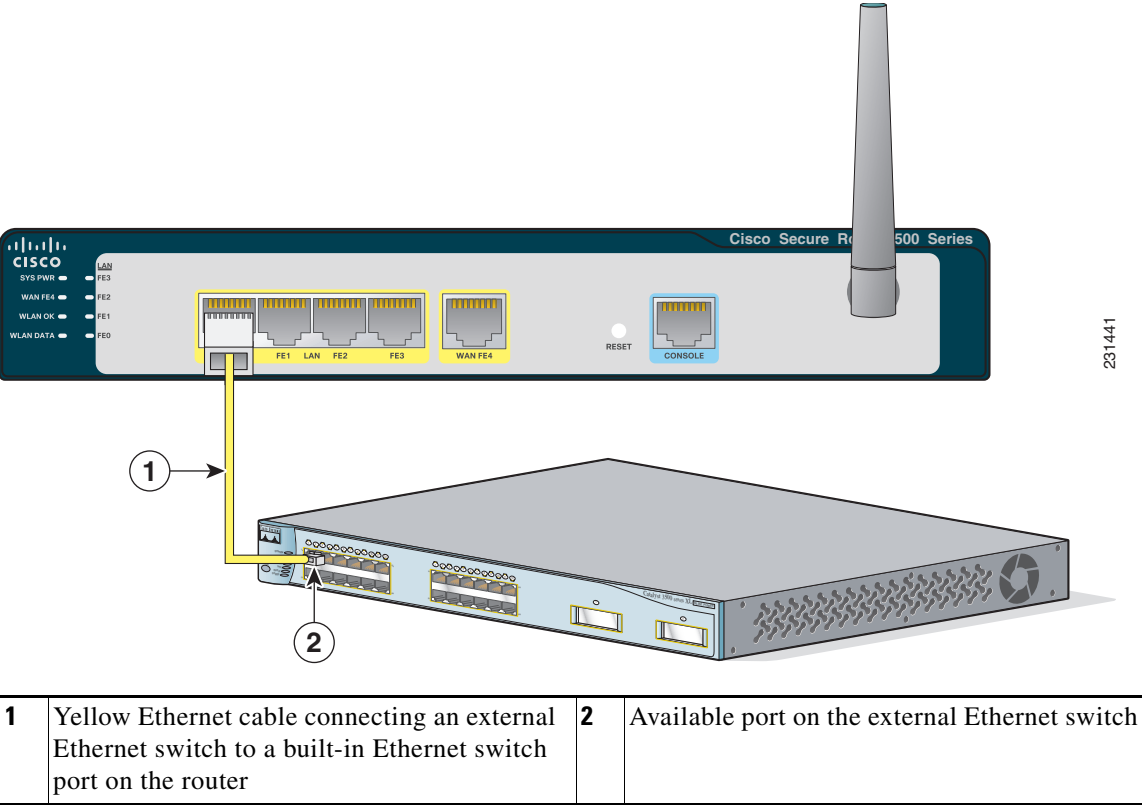
- Step 1** Connect one end of the yellow Ethernet cable to a built-in Ethernet switch port on the router.
- Step 2** Connect the other end of the cable to the RJ-45 port on the network interface card (NIC) that is installed in the PC, server, or workstation.
- Step 3** (Optional) Connect additional servers, PCs, or workstations to the other built-in Ethernet switch ports.

Connecting an External Ethernet Switch (Optional)

If more than four PCs need to be connected to each other in an office, connect an external Ethernet switch to one of the router’s built-in switch ports, and then connect additional PCs to that switch.

Figure 4-5 shows an external Ethernet switch connected to a built-in Ethernet switch port on the router. Although the figure shows a Cisco Secure Router 520 Ethernet-to-Ethernet router, this procedure applies to all Cisco Secure Router 520 Series routers.

Figure 4-5 Connecting to an Ethernet Switch



(Optional) To connect the router to an external Ethernet switch, follow these steps:

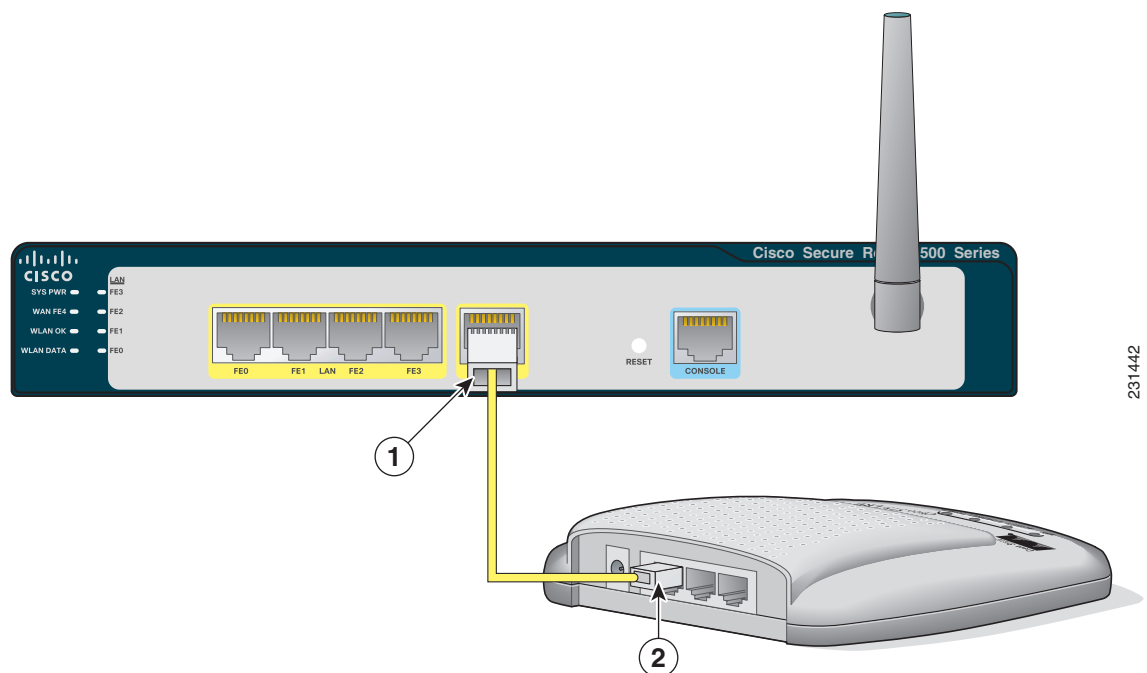
-
- Step 1** Connect one end of the yellow Ethernet cable to a built-in Ethernet switch port on the router.
- Step 2** Connect the other end of the cable to an available port on the Ethernet switch to add an additional Ethernet connection.
- Step 3** Turn on the Ethernet switch.
-

Connecting a Broadband Modem

This section applies only to the Cisco Secure Router 520 Ethernet-to-Ethernet router.

You can connect to the Internet by connecting the router to a broadband modem. Figure 4-6 shows a broadband modem connected to a Ethernet WAN port on a Cisco Secure Router 520 Ethernet-to-Ethernet router.

Figure 4-6 Connecting to a Broadband Modem



1	Ethernet WAN port on the router	2	Available port on the modem
----------	---------------------------------	----------	-----------------------------

To connect the router to an installed DSL, cable, or long-reach Ethernet modem, follow these steps:

-
- Step 1** Connect one end of the yellow cable to the Ethernet WAN FE4 port.
- Step 2** Connect the other end of the cable to an available port on the modem.

To determine which port on the modem to connect to, follow the instructions provided with your broadband modem.

Step 3 Turn on the broadband modem.

Connecting an ADSL Line—ADSLoPOTS Port

This section applies only to the Cisco Secure Router 520 ADSL-over-POTS router.

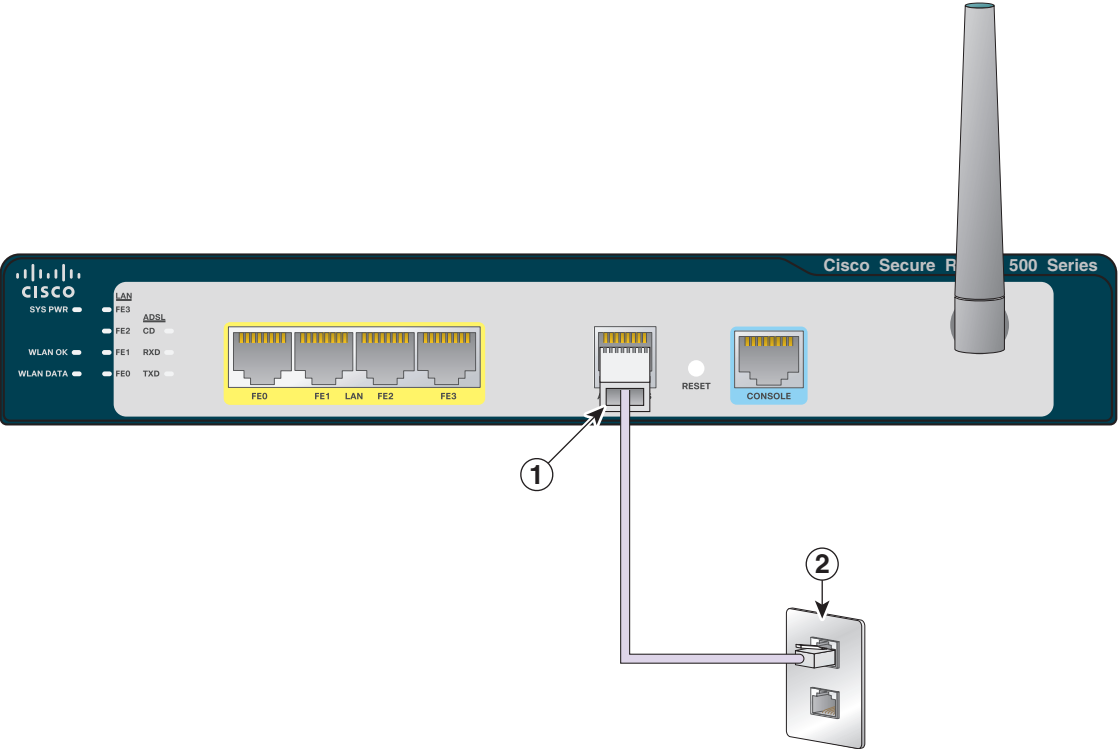
Figure 4-7 shows the asymmetric digital subscriber line over plain old telephone service (ADSLoPOTS) port on the router connected to an ADSL line.



Note

The DSL line must have been provisioned by your service provider and correctly configured so that the ADSL CD LED shows the status. If the ADSL CD LED is not on, contact the DSL service provider.

Figure 4-7 Connecting the ADSLoPOTS Port to an ADSL Line



1	ADSLoPOTS port on the router	2	End of ADSL cable connects to the wall jack
----------	------------------------------	----------	---

You can connect the ADSL cable directly to a cable wall jack or you can connect it to the wall jack using a splitter.

To connect the ADSL cable, perform one of the following, as appropriate:

- To connect the ADSL cable directly to a cable wall jack see [Figure 4-7 on page 4-9](#). Then follow these steps:
 - Connect one end of the ADSL cable to the ADSLoPOTS port on the router.
 - Connect the other end of the cable to the wall jack.
- To connect the ADSL cable to a cable wall jack using a splitter, see [Figure 4-8 on page 4-11](#). Then follow these steps:



Note Although [Figure 4-8](#) shows an ADSL-over-ISDN (ADSLoISDN) port, the connection to the splitter is the same for both ADSLoPOTS and ADSLoISDN ports.

- Connect the RJ-11 end of the ADSL cable to the ADSLoPOTS port on the router.
- Connect the other RJ-11 end of the ADSL cable to the local ADSL connector port on the ADSL splitter. The ADSL splitter is provided by the DSL service provider.
- Connect the unshielded Category 5 cable from the outside ADSL port on the splitter to a wall jack.



Note You must provide the unshielded Category 5 cable for connecting to the splitter. The splitter is provided by the DSL service provider.

Connecting an ADSL Line—ADSLoISDN Port

This section applies only to the Cisco Secure Router 520 ADSL-over-ISDN router. The procedure for connecting an asymmetric digital subscriber line (ADSL) depends on the router and, in some cases, on the location.



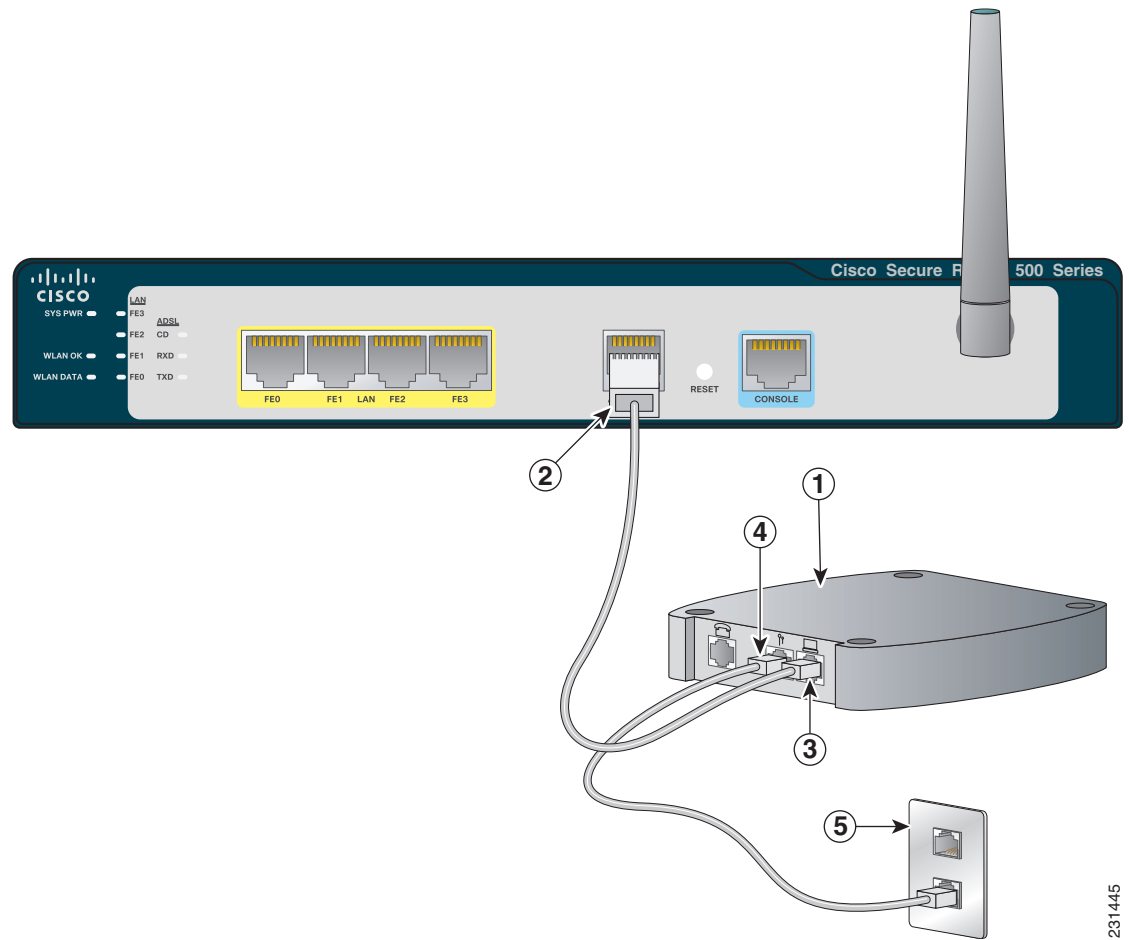
Note The DSL line must have been provisioned by your service provider and correctly configured so that the ADSL CD LED shows the status. If the ADSL CD LED is not on, contact the DSL service provider.



Note You must provide the unshielded Category 5 cable for connecting to the ADSL ISDN splitter. The ADSL ISDN splitter is provided by the DSL service provider.

Figure 4-8 shows the ADSLoISDN port on the router connected to a cable wall jack using a splitter.

Figure 4-8 Connecting the ADSLoISDN Port to an ADSL Line



1	ADSL splitter (provided by the DSL service provider)	2	One end of the ADSL cable connects to the router
3	Other end of the ADSL cable connects to the splitter	4	RJ-11 end of an unshielded Category 5 cable connects to the splitter
5	Other end of the unshielded Category 5 cable connects to the wall jack		

231445

You can connect the ADSL cable directly to a cable wall jack or you can connect it to the wall jack using a splitter.

To connect the ADSL cable, perform one of the following, as appropriate:

- To connect the ADSL cable directly to a cable wall jack see [Figure 4-7 on page 4-9](#). Then follow these steps:



Note Although [Figure 4-7](#) shows an ADSLoPOTS port, the connection to the wall jack is the same for both ADSLoISDN and ADSLoPOTS ports.

- Connect one end of the ADSL cable to the ADSLoISDN port on the router.
 - Connect the other end of the cable to the wall jack.
- To connect the ADSL cable to a cable wall jack using a splitter, see [Figure 4-8 on page 4-11](#). Then follow these steps:
 - Connect the RJ-11 end of the ADSL cable to the ADSLoISDN port on the router.
 - Connect the other RJ-11 end of the ADSL cable to the local ADSL connector port on the ADSL splitter. The ADSL splitter is provided by the DSL service provider.
 - Connect the unshielded Category 5 cable from the outside ADSL port on the splitter to a wall jack.



Note You must provide the unshielded Category 5 cable for connecting to the ADSL ISDN splitter. The ADSL ISDN splitter is provided by the DSL service provider.

Connecting the AC Adapter

[Figure 4-9](#) shows how to connect the AC adapter to the router and to an electrical outlet.



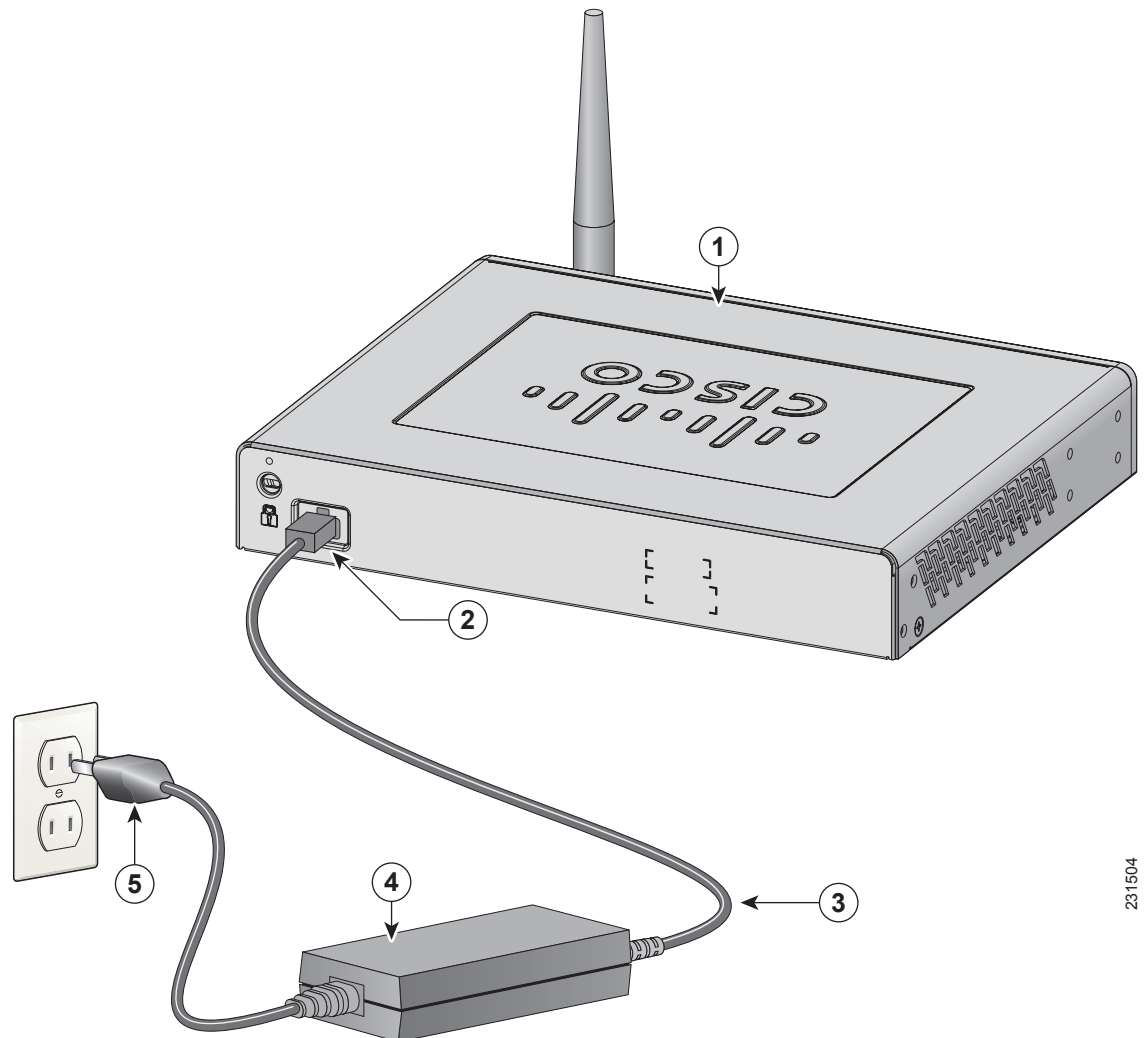
Warning

The device is designed to work with TN power systems. Statement 19



Warning

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120VAC, 20A U.S. (240VAC, 16 to 20A international) is used on the phase conductors (all current-carrying conductors). The fuse or circuit breaker must have adequate safety approvals recognized by the country of usage. Statement 119

Figure 4-9 **Connecting the AC Adapter**

231504

1	Router	2	AC adapter input jack on the router
3	Power cord	4	AC adapter
5	Electrical outlet		

To connect the AC adapter to the router and to an electrical outlet, follow these steps:

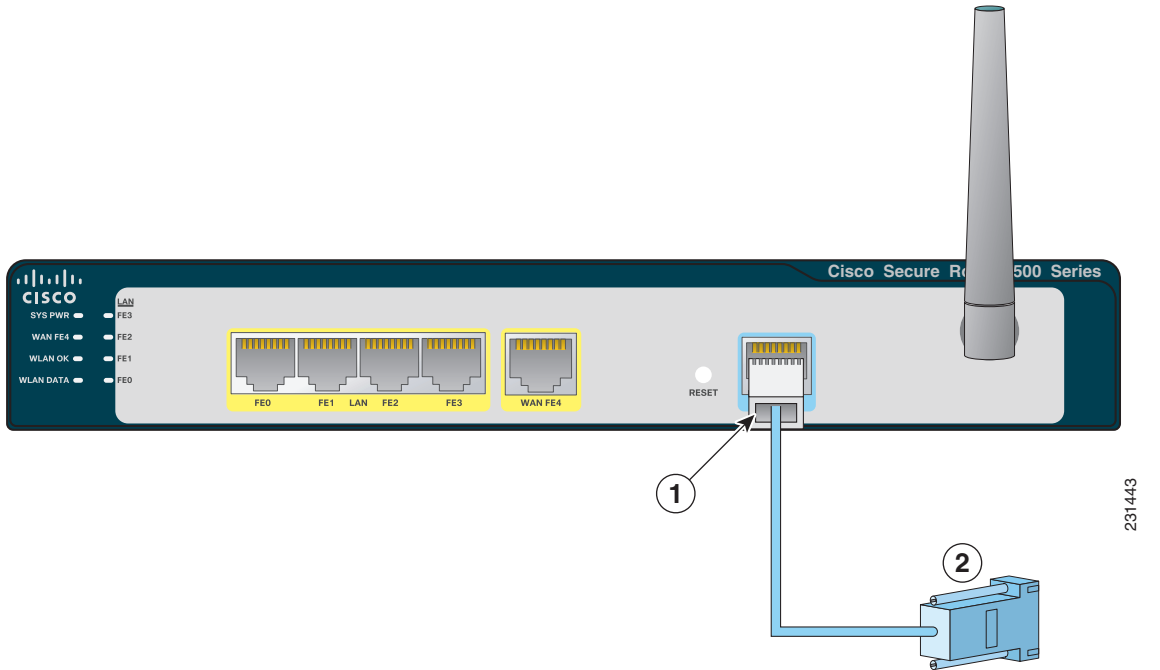
-
- Step 1** Connect one end of the power supply cable into the input jack on the router.
- Step 2** Connect the other end of the power supply cable to the AC adapter.
- Step 3** Plug the power cord of the AC adapter into an electrical outlet.
-

Connecting a Terminal or PC to the Console Port

The console port is a service port to which you can connect a terminal or PC either to configure the software by using the command-line interface (CLI) or to troubleshoot problems with the router.

Figure 4-10 shows a DB-9 connector from a PC connected to the console port on the router. Although the figure shows a Cisco Secure Router 520 Ethernet-to-Ethernet router, this procedure applies to all Cisco Secure Router 520 Series routers.

Figure 4-10 Connecting a Terminal or PC to the Console Port



1	Console port on the router	2	DB-9 connector
---	----------------------------	---	----------------

To connect the router’s console port to a terminal or PC, follow these steps:

- Step 1
- Connect the RJ-45 connector on the light blue cable to the router’s console port.
- Step 2
- Connect the DB-9 connector to a terminal or PC.

Connecting an Asynchronous Modem to the Console Port

The Cisco Secure Router 520 Series routers support the dial backup function, which allows a user to connect an asynchronous (analog) modem to the console port as a backup link to the WAN port in case the ADSL service goes down.

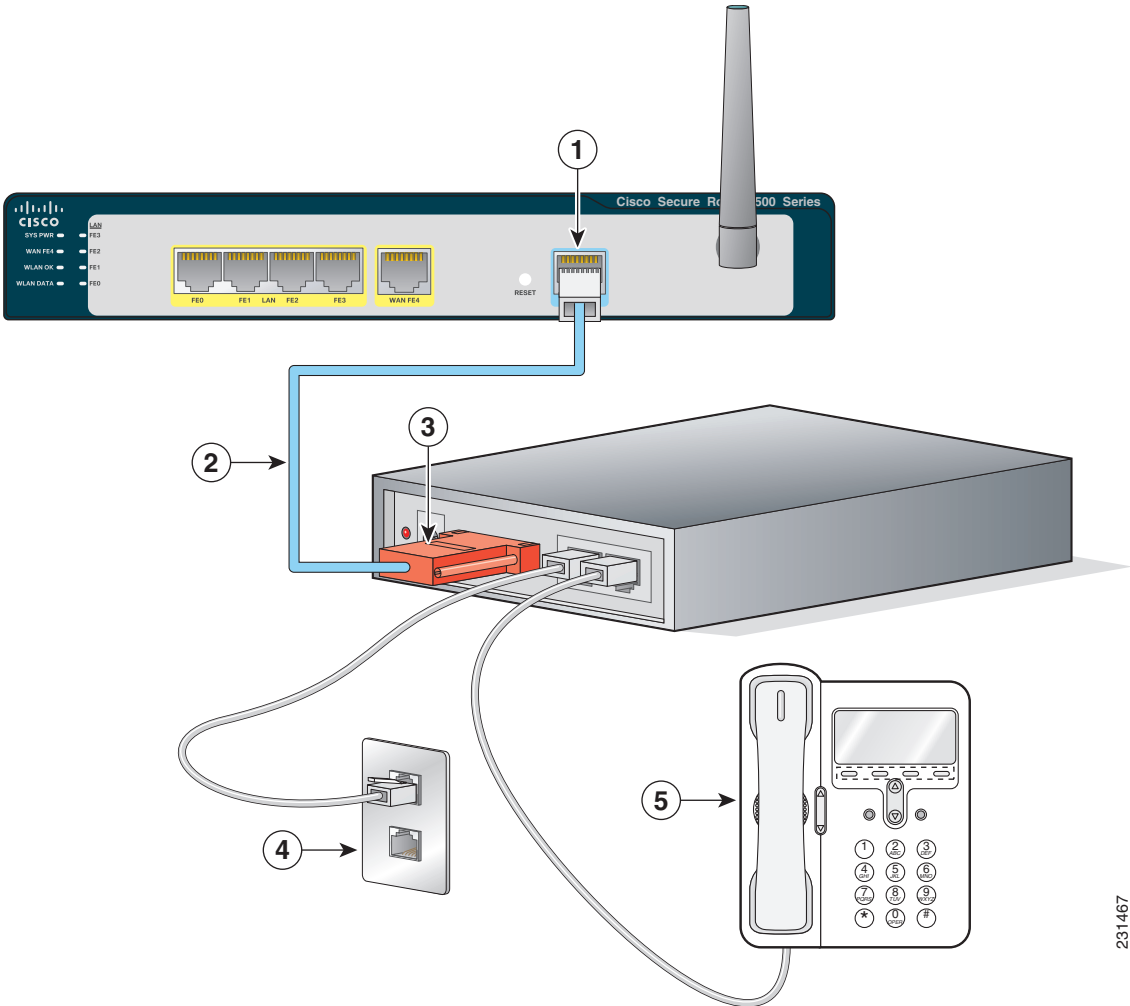


Note

To connect an asynchronous modem to the console port, you must have an optional router modem cable. Contact your router vendor to order this cable.

Figure 4-11 shows an asynchronous modem connected to the console port on the router. Although the figure shows a Cisco Secure Router 520 Ethernet-to-Ethernet router, this procedure applies to all Cisco Secure Router 520 Series routers.

Figure 4-11 Connecting an Asynchronous Modem to the Console Port



231467

1	Router console port	2	RJ-45-to-DB-25 router modem cable
3	Available port on an asynchronous modem	4	Wall jack connected by an RJ-11 telephone cable to a port on an asynchronous modem
5	Telephone connected by an RJ-11 telephone cable to a port on an asynchronous modem (optional)		

To connect the console port on the router to an asynchronous modem, follow these steps:

-
- Step 1** Connect the RJ-45 end of the router modem cable to the console port.
- Step 2** Connect the DB-25 connector end of the router modem cable to an available port on the asynchronous modem.
- Step 3** Connect one end of the RJ-11 telephone cable to a wall jack, and then connect the other end of the RJ-11 cable to the modem.
- Step 4** (Optional) Connect one end of an RJ-11 telephone cable to a telephone, fax, or other device, and then connect the other end of the RJ-11 cable to the modem.
-

Verifying Router Operation

To verify that all devices are properly connected to the router, turn on all the connected devices, and then using [Table 4-1](#), verify correct router operation by checking the LEDs.

Table 4-1 Verifying Router Operation

Power and Link	LEDs to Check	Normal Patterns
Power	SYS PWR	On when power is supplied to the router.
To servers, PCs, or workstations connected to the Ethernet LAN ports (FE0, FE1, FE2, or FE3)	FE0, FE1, FE2, or FE3	FE0, FE1, FE2, or FE3 is on when the LAN port is physically connected to a server, PC, or workstation.
To broadband modem or to an external Ethernet switch (WAN FE4)	WAN FE4	WAN FE4 is on when the WAN port is physically connected to a broadband modem or to an external Ethernet switch.
To wireless LAN	WLAN OK	Wireless LAN link status: <ul style="list-style-type: none">• Solid green if at least one client is associated.• Blinks if no client is associated.
	WLAN DATA	WLAN DATA is on if there is traffic on the wireless link.
To xDSL line (ADSLoPOTS or ADSLoISDN)	ADSL CD	On when the xDSL carrier detects status and connects to the digital subscriber line access multiplexer (DSLAM).
	ADSL RXD	ADSL RXD blinks when the xDSL line receives a packet.
	ADSL TXD	ADSL TXD blinks when the xDSL line sends a packet.

What to Do Next

For information and instructions on using the CLI to configure the router, see the *Cisco Secure Router 520 Series Software Configuration Guide*.



CHAPTER 5

Troubleshooting

This chapter describes problems that could occur with the router hardware, possible causes of the problems, and steps for solving the problems. This chapter contains the following sections:

- [Before You Call Your Cisco Reseller, page 5-1](#)
- [Problems During First Startup, page 5-2](#)
- [Problems After the Router Is Running, page 5-3](#)

For more information on problems that could occur with the software, see the *Cisco Secure Router 520 Series Software Configuration Guide*.

Before You Call Your Cisco Reseller

Some of the solutions in this chapter instruct you to contact your Cisco reseller. Before you contact your reseller, have the following information ready.

Type of Information	Your Information
Router model and serial number (on the back panel)	
Maintenance agreement or warranty information	
Date you received the router	
Brief description of the problem	
Brief description of the steps you have taken to resolve the problem	

Problems During First Startup

Table 5-1 lists problems that could occur the first time you turn on the router.

Table 5-1 *Problems During First Startup*

Symptom	Problem	Solutions
All LEDs, including SYS PWR LED, are off.	No power to router.	Perform the following tasks in the order given: <ol style="list-style-type: none"> 1. Check that the power switch is set to ON. 2. Check that all connections to and from the power supply are secure. 3. Check that the power outlet has power. 4. If the problem continues, the power supply could be faulty. Contact your Cisco reseller.
No connection to modem or to Ethernet switch. (WAN FE4 LED is off.)	A cable-related problem: <ul style="list-style-type: none"> • Improperly connected cable. • Damaged cable. 	Perform the following tasks in the order given: <ol style="list-style-type: none"> 1. Check that you have cabled the device correctly. Review the instructions in Chapter 4, “Router Installation.” 2. Check that the connectors at both ends of the cable are securely seated. 3. Check whether the cable is physically damaged. If it is damaged, order another cable from Cisco, or replace it with a similar cable.
No connection to Ethernet devices. (LAN—FE0, FE1, FE2, and FE3 are off.)	A cable-related problem: <ul style="list-style-type: none"> • Improperly connected cable. • Damaged cable. 	Perform the following tasks in the order given: <ol style="list-style-type: none"> 1. Check that you have cabled the device correctly. See Chapter 4, “Router Installation.” 2. Check that the connectors at both ends of the cable are securely seated. 3. Check whether the cable is physically damaged. If it is damaged, order another cable from Cisco Systems, or replace it with a similar cable.
Cannot connect to the Internet.	<ul style="list-style-type: none"> • Broadband modem or external Ethernet switch is not connected or turned on. • There is a problem with the broadband or WAN service. • Router is improperly configured. 	<ul style="list-style-type: none"> • Reconnect the broadband modem or external Ethernet switch, and make sure that it is receiving power. • Check with the Internet service provider or corporate network administrator to determine whether there is a problem. • Configure the router by using a PC that is connected to the console port.

Table 5-1 Problems During First Startup (continued)

Symptom	Problem	Solutions
No connection to xDSL link. (The CD LED on the front panel is off for a long time.)	A cable-related problem: <ul style="list-style-type: none"> Wrong cable. 	<ul style="list-style-type: none"> Check that you are using the correct cable. See Appendix A, “Specifications.”
No connection to xDSL link. (The CD LED on the front panel is off for a long time.)	A cable-related problem: <ul style="list-style-type: none"> Improperly connected cable. 	<ul style="list-style-type: none"> Check that you have connected the ADSL cable properly. See Chapter 4, “Router Installation.” Check that the ADSL port is connected to the correct port on the ISDN splitter. Check that the connectors at both ends of the cable are securely seated.

Problems After the Router Is Running

[Table 5-2](#) lists problems that could occur after the router has been up and running.

Table 5-2 Problems After the Router Is Running

Symptom	Problem	Solutions
Problems with Ethernet connection. (LAN—FE0, FE1, FE2, and FE3—LEDs are off.)	A cable-related problem: <ul style="list-style-type: none"> Disconnected cable. Damaged cable. 	Perform the following tasks in the order given: <ol style="list-style-type: none"> Check that the connectors at both ends of the cable are secure. Check whether the cable is physically damaged. If it is damaged, order another cable from Cisco Systems, or replace it with a similar cable.
Connection to the broadband or Ethernet line is intermittent or lost. (The WAN FE4 LED or ADSL CD LED on the front panel is off.)	A cable-related problem: <ul style="list-style-type: none"> Disconnected cable. Damaged cable. 	Perform the following tasks in the order given: <ol style="list-style-type: none"> Check that the connectors at both ends of the cable are secure. Check that the cable is not physically damaged. If it is damaged, order another cable from Cisco Systems, or replace it with a similar cable.
Connection to the broadband or Ethernet line is intermittent or lost. (The WAN FE4 LED or ADSL CD LED on the front panel is off.)	Problem with broadband line or WAN service.	Contact your broadband line or WAN service provider to determine whether there is a problem with the broadband or WAN service.
Connection to the xDSL line or the WAN port is lost. (The WAN FE4 LED and the LAN—FE0, FE1, FE2, or FE3—LEDs on the front panel are off.)	Problem with DSL line or WAN service.	Contact your DSL line or WAN service provider to determine whether there is a problem with the DSL or WAN service.

Table 5-2 **Problems After the Router Is Running (continued)**

Symptom	Problem	Solutions
Connection to the xDSL line is intermittent or lost. (The ADSL CD LED on the front panel is off.)	A cable-related problem: <ul style="list-style-type: none"> • Disconnected cable. • Damaged cable. 	<ul style="list-style-type: none"> • Check that the Ethernet port is not configured to be administratively down. • Check that the device connected to the Ethernet port is connected, powered on, and properly configured. • Check that the connectors at both ends of the cable are secure. • Check whether the cable is physically damaged. If it is damaged, order another cable from Cisco Systems or replace it with a similar cable.
Connection to the xDSL line or WAN is lost. (The ADSL CD LED and the LAN—FE0, FE1, FE2, or FE3—LEDs on the front panel are off).	Problem with xDSL or WAN service.	<ul style="list-style-type: none"> • Check all passwords and device names to make sure that they are correct. • Contact your DSL line or WAN service provider to determine whether there is a problem with the ADSL or WAN service.



APPENDIX A

Specifications

This appendix provides system, port, and cabling specifications for the Cisco Secure Router 520 Series routers. It contains the following sections:

- [Router Specifications, page A-1](#)
- [LAN Port Pinouts, page A-2](#)
- [Console Connector Pinouts, page A-3](#)
- [ADSL Port Connector Pinouts, page A-3](#)
- [Cable Specifications, page A-4](#)

Router Specifications

[Table A-1](#) provides the system specifications for the routers.

Table A-1 Router Specifications

Description	Design Specification
Physical Dimensions	
Dimensions (W x D x H)	<ul style="list-style-type: none">• With antenna connectors: 10.578 in. (268.68 mm) x 8.65 in. (219.72 mm) x 1.719 in. (43.66 mm)• Without antenna connectors: 10.578 in. (268.68 mm) x 8.289 in. (210.54 mm) x 1.719 in. (43.66 mm)
Weight (not including desktop power supply)	3.7 lb
Environmental Operating Ranges	
Nonoperating temperature	–4 to 149°F (–20 to 65°C)
Nonoperating humidity	5 to 95% relative humidity
Nonoperating altitude	0 to 15,000 ft (4570 m)
Operating temperature	32 to 104°F (0 to 40°C)
Operating humidity	10 to 85% relative humidity
Operating altitude	0 to 10,000 ft (3000 m)
Router Power	
AC input voltage	100 to 240 VAC

Table A-1 Router Specifications (continued)

Description	Design Specification
Frequency	50 to 60 Hz
Power output	26 W maximum
Output voltages	5 V and 12 V
Integrated 802.11b/g Radio Module	
Radio technology	IEEE 802.11b and 802.11g standard compliant
Operating frequency	2412 to 2484 MHz ISM ¹ band
Modulation schemes	OFDM ² , DQPSK ³ , DBPSK ⁴ 16 QAM ⁵ , 64 QAM, and CCK ⁶
Number of channels	11 channels for the U.S., 13 channels for Europe, 14 channels for Japan
Data rate	54 Mbps with fallback rates of 48, 36, 24, 18, 12, 9, and 6 Mbps
Media access protocol	CSMA/CA ⁷ with ACK ⁸
Power consumption (typical)	500 mA 3.3V at transmit mode, 320 mA/3.3V at receive mode

1. ISM = Industrial, Scientific, and Medical.
2. OFDM = orthogonal frequency-division multiplexing.
3. DQPSK = differential quaternary phase shift keying.
4. DBPSK = differential binary phase shift keying.
5. QAM = quadrature amplitude modulation.
6. CCK = complementary code keying.
7. CSMA/CA = carrier sense multiple access with collision avoidance.
8. ACK = acknowledgement.

LAN Port Pinouts

Table A-2 provides pinouts for the Ethernet LAN port on the routers.

Table A-2 Ethernet LAN Port Pinouts

Pin	Function
1	RX+
2	RX–
3	TX+
4	Unused
5	Unused
6	TX–
7	Unused
8	Unused

Console Connector Pinouts

Table A-3 provides pinouts for the console connector (for connecting a terminal or PC).

Table A-3 Console Connector Pinouts (RJ-45-to-DB-9)

RJ-45 Pin	Function	DB-9 Pin
1	RTS	8
2	DTR	6
3	TXD	2
4	GND	5
5	GND	5
6	RXD	3
7	DSR	4
8	CTS	7

The console port is configured as a data communications equipment (DCE) device. The default parameters for the console port are as follows:

- 9600 baud
- 8 data bits
- No parity
- One stop bit

ADSL Port Connector Pinouts

Table A-4 provides the ADSL connector pinouts.

Table A-4 ADSL Connector Pinouts (RJ-11-to-RJ-45)

RJ-11 Pin	Function	RJ-45 Pin	Function
1	Unused	1	Unused
2	Unused	2	Unused
3	Ring	3	Unused
4	Tip	4	Ring
5	Unused	5	Tip
6	Unused	6	Unused
		7	Unused
		8	Unused

Cable Specifications

This section provides specifications for the following Ethernet cables, which you might need to provide:

- Straight-through cable
- Crossover cable

Because of the autocrossover (autosensing) function, both straight-through and crossover cables can be used for the Ethernet LAN port.

Ethernet Cable Specifications

Table A-5 provides specifications that apply to both straight-through and crossover Ethernet cables.

Table A-5 **Ethernet Cable Specifications**

Type	Category
10BASE-T	Category 3 or 5
100BASE-T	Category 5 or higher

Maximum Cable Length

The maximum length for the Ethernet cables that connect the equipment to the router is 328 ft (100 m). This length is also the maximum distance between the router and the equipment connected to it.



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